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DEMAND 2715(00) PA JT COOPERATION TREAT

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PCT

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

Date of mailing (day/month/year) 04 May 2000 (04.05.00)	SP wa file
Applicant's or agent's file reference 98P4854	EP P62
International application No. PCT/GB99/03546	International filing date (day/month/year) 26 October 1999 (26.10.99)
Applicant ROKE MANOR RESEARCH LIMITED et al	Priority date (day/month/year) 27 October 1998 (27.10.98)

From the INTERNATIONAL BUREAU

To:

ALLEN, Derek
 Siemens Shared Services Limited
 Intellectual Property Department
 Siemens House
 Oldbury, Bracknell
 Berkshire RG12 8F RECEIVED
 ROYAUME-UNI

12 MAY 2000

IMPORTANT NOTICE

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:

CN,JP,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

EP

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on

04 May 2000 (04.05.00) under No. WO 00/25438

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

PCT/INT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION
(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 22 May 2000 (22.05.00)	
International application No. PCT/GB99/03546	Applicant's or agent's file reference 98P4854
International filing date (day/month/year) 26 October 1999 (26.10.99)	Priority date (day/month/year) 27 October 1998 (27.10.98)
Applicant HULBERT, Anthony, Peter	

1. The designated Office is hereby notified of its election made:

in the demand filed with the International Preliminary Examining Authority on:

16 March 2000 (16.03.00)

in a notice effecting later election filed with the International Bureau on:

2. The election was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Pascal Piriou
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

M.H

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 98P4854	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 99/ 03546	International filing date (<i>day/month/year</i>) 26/10/1999	(Earliest) Priority Date (<i>day/month/year</i>) 27/10/1998
Applicant ROKE MANOR RESEARCH LIMITED et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :
 - contained in the international application in written form.
 - filed together with the international application in computer readable form.
 - furnished subsequently to this Authority in written form.
 - furnished subsequently to this Authority in computer readable form.
 - the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 - the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. Certain claims were found unsearchable (See Box I).

3. Unity of invention is lacking (see Box II).

4. With regard to the title,

- the text is approved as submitted by the applicant.
- the text has been established by this Authority to read as follows:

A METHOD FOR IMPROVED EXTRACTION IN CDMA SYSTEMS

5. With regard to the abstract,

- the text is approved as submitted by the applicant.
- the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

- as suggested by the applicant.
- because the applicant failed to suggest a figure.
- because this figure better characterizes the invention.

1

None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 99/03546

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: 13, 14 because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
Claims 13 and 14 make reference to drawings contrary to Rule 6.2(a) PCT.

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 13 14

Claims 13 and 14 make reference to drawings contrary to Rule 6.2(a) PCT.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

International Application No

GB 99/03546

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04B1/707

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 96 24206 A (NOKIA MOBILE PHONES LTD ;HOTTINEN ARI (FI); OJANPERAE TERO (FI); L) 8 August 1996 (1996-08-08)</p> <p>page 4, line 8 -page 5, line 2</p> <p>page 5, line 26 -page 6, line 21</p> <p>page 14, line 22 - line 32</p> <p>page 15, line 21 - line 26</p> <p>page 16, line 26 -page 17, line 15</p> <p>page 18, line 16 -page 19, line 2</p> <p>page 19, line 27 - line 33; figures 6,7</p> <p>page 20, line 24 -page 21, line 33; claims 1,2,7-12,18-23; figure 8</p> <p>---</p> <p>-/-</p>	1-12

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

7 February 2000

Date of mailing of the international search report

16. 02. 2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
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Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
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Authorized officer

Nilsson, M

INTERNATIONAL SEARCH REPORT

International Application No

GB 99/03546

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A P, A	JP 10 013305 A (NEC CORP) 16 January 1998 (1998-01-16) & US 5 926 471 A (SHOJI TAKASHI) 20 July 1999 (1999-07-20) column 2, line 62 -column 3, line 20 column 3, line 37 - line 62 column 4, line 40 - line 49 column 5, line 10 - line 60; figures 1,2 -----	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/03546

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO 9624206	A 08-08-1996	FI 950463 A		03-08-1996
		AU 4541796 A		21-08-1996
		BR 9606841 A		26-05-1998
		CN 1173254 A		11-02-1998
		EP 0807345 A		19-11-1997
		JP 10513319 T		15-12-1998
JP 10013305	A 16-01-1998	JP 2850858 B		27-01-1999
		US 5926471 A		20-07-1999

PATENT COOPERATION TREATY

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REC'D 29 NOV 2000
WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

4

Applicant's or agent's file reference F21521/98P4854	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB99/03546	International filing date (day/month/year) 26/10/1999	Priority date (day/month/year) 27/10/1998	
International Patent Classification (IPC) or national classification and IPC H04B1/707			
Applicant ROKE MANOR RESEARCH LIMITED et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 9 sheets.

3. This report contains indications relating to the following items:

- I Basis of the report
- II Priority
- III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

Date of submission of the demand 16/03/2000	Date of completion of this report
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Staeger, R Telephone No. +49 89 2399 8124



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/03546

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).:*)

Description, pages:

1,2,6-12	as originally filed	
3-5,5a	with telefax of	18/10/2000
		17

Claims, No.:

1-16	with telefax of	18/10/2000
		17

Drawings, sheets:

1/2,2/2	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/03546

the description, pages:

the claims, Nos.:

the drawings, sheets:

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims 1-16
 No: Claims

Inventive step (IS) Yes: Claims 1-16
 No: Claims

Industrial applicability (IA) Yes: Claims 1-16
 No: Claims

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03546

V. Reasoned statement with regard to novelty and inventive step:

0. The invention is related to extracting a desired signal from a plurality of other received signals interfering with the desired signal.
1. The main prior art CDMA receiver techniques dealing with this object are known as interference cancellation (or subtractive demodulation) and joint detection. There basic features are indicated in the description p. 1, l. 17 to p. 2, l. 25. Two documents using such receiver techniques are mentioned on page 3 in the description. For both mentioned techniques it is necessary to know the bit rates (related to CDMA spreading factors) for each of the received signals. Usually the information about the bit rate is carried in so called TFI (transport format indicator) data which are encoded and spread out over a complete transmission frame. Therefore, the bit rate is not available before the whole current frame is received. This causes problems as indicated in the description p. 2, l. 26 to p. 3, l. 22.
2. **Problem:**
To provide an improved method and apparatus of extracting a signal, which overcome the problems of the prior art.
3. **Solution:**
Compared to the **available** prior art, the claims 1 and 10 are rendered inventive by the disclosed processing steps and related apparatus and path structure, which acts to determine the bit rate of a **received frame** and use said bit rate **to manipulate a subsequently received frame** and thereby assist extracting the desired signal from interfering signals,
4. None of the documents of the Search Report gives an indication to such processing of a composite received signal.

VIII Certain observations:

1. Apparently, in claims 13-16 the word "method" is not intended and in claims 6 and 14 the word "interference" seems to be intended instead of "deference".

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possible without using it. This means that before the applicant of interference cancellation, it may be impossible to demodulate the TFI bits, leading to a deadlock situation. This is true even though the DPCCH and DPDCH are transmitted on nominally orthogonal (I and Q) channels since 5 multipath will seriously degrade this orthogonality and because the different signals will be received at the base station with arbitrary mutual carrier phase.

Secondly, power control information is generated by making signal to noise plus interference measurements on the DPCCH within the time period of the frame. Thus, if interference cancellation or joint detection cannot be 10 applied until the end of the frame, these measurements will need to be based on the signal to noise plus interference (SNI) without the benefit of interference cancellation or joint detection. If the power control measurement threshold is based on an adequate SNI ratio at this stage, then the resultant SNI ratio after the operation of interference cancellation or joint 15 detection will be higher than necessary. On the other hand, attempting to base the power control measurements on there being an adequate SNI ratio after the operation of interference cancellation or joint is problematic because: a) the SNI ratio at the measurement stage will be very low – probably too low to measure, and b) it is not possible to predict, a priori, how 20 effective the interference cancellation or joint detection will be in any given slot.

US-A-5151919 (Ericsson) provides a subtractive CDMA demodulation system which optimally decodes a coded system embedded in many other overlapping signals making up a received composite signal. A radio receiver 25 correlated a unique code corresponding o the desired signal to be decoded with the composite signal. WO96/24206 (Nokia) provides a CDMA system in which several users communicate simultaneously on the same frequency band, and in which each user has its own spreading code. For reception of

signals, signal correlators use synchronisation with waveforms of different types to aid decoding.

It is therefore an object of the present invention to provide an improved method of extracting a signal which overcomes the problems mentioned
5 above.

In accordance with one aspect of the present invention, there is provided, in a communication system employing coded signals, a method of extracting a desired coded signal from a composite signal comprising the desired signal and one or more interfering coded signals, the method comprising the steps of:-

- a) receiving a composite signal;
- b) processing, for each received signal code, individual signals in a first signal processor;
- c) determining transport format indicator (TFI) signals using buffer and decoder circuits to provide a bit rate of a frame for at least one interfering signal;
- 10 d) dividing the TFI signal path into first and second signal paths;
- e) wherein, in a first signal path TFI signals are passed via a latch to provide the first signal processor with a TFI signal, whereby to assign the bit rate determined for said last frame for the next frame; and
- f) wherein, in the second path TFI signals are passed to a further signal processor to adjust the bit rate of an output signal.

In accordance with a further aspect of the present invention there is provided, in a communication system employing coded signals, apparatus operable to extract a desired coded signal from a composite signal comprising the desired signal and one or more interfering coded signals, the apparatus comprising:-

- a) receiver means arranged to receive a signal;

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b) a first signal processor for processing individual signals, for each received signal code;

c) buffer and decoder circuits for determining transport format indicator (TFI) signals, to provide a bit rate of a frame for at least one interfering

5 signal;

d) a path divider for dividing the TFI signal path into first and second signal paths;

wherein, in the first signal path, TFI signals are passed via a latch, to provide the first signal processor with a TFI signal, whereby to assign the bit rate

10 determined for said last frame for the next frame; and

wherein, in the second path, TFI signals are passed to a further signal processor to adjust the bit rate of an output signal.

For a better understanding of the present invention, reference will now be made, by way of example only, to the accompanying drawings in which:-

15 Figure 1 illustrates a block diagram of one embodiment of a part of a base station of a telecommunications system in accordance with the present invention; and

Figure 2 illustrates a block diagram of another embodiment of a part of a base station in accordance with the present invention.

20 In accordance with the present invention, a first iteration of interference cancellation or joint detection is performed on incoming signals on the basis that the bit rates for every signal are the same as they were for the same signal in the previous frame. Although this assumption may not be true for all of the signals, it should be true for the vast majority of signals

25 whenever a large number of signals are present. If the frame rate is correct, for example, for 90% of signals, then nominally 90% of the interference would be cancelable. The unsuccessful attempt to cancel the remaining 10% of interference would add a further 10%, leaving the interference at 20% in

-5a-

the ideal case. This provides a 7dB reduction in interference – a very useful start.

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1. In a communication system employing coded signals, a method of extracting a desired coded signal from a composite signal comprising the desired signal and one or more interfering coded signals, the method comprising the steps of:-
 - a) receiving a composite signal;
 - b) processing, for each received signal code, individual signals in a first signal processor (112 – 118; 400);
 - c) determining transport format indicator (TFI) signals using buffer and decoder circuits (254, 264; 420, 430) to provide a bit rate of a frame for at least one interfering signal;
 - d) dividing the TFI signal path into first and second signal paths;
 - e) wherein, in a first signal path (442, 452), TFI signals are passed via a latch (290; 440, 450) to provide the first signal processor with a TFI signal, whereby to assign the bit rate determined for said last frame for the next frame; and
 - f) wherein, in the second path (422, 432), TFI signals are passed to a further signal processor (262; 500) to adjust the bit rate of an output signal (280; 510 – 540).
2. A method according to Claim 1 wherein the first signal processor comprises a bank of Rake receiver (112-118), each Rake receiver (112-118) demodulating and despreading only signals having a code associated with the Rake receiver, each Rake receiver (112-118) outputting a decision variable signal which is applied to a decision device (122-128) which limits the output and, the decision device (122-128) outputting to a remodulation/respread unit (132-138) which provides a remodulated and respread signal to a channel reconstruction filter (142-148), the

-14-

filter (142-148) receiving a channel estimation signal (CE1) from said Rake receiver (112-118) to provide a reconstructed signal.

3. A method according to Claim 2 wherein the reconstructed signal is fed to a summer (150) to provide a signal (155) which is then subtracted in a bank of subtractors (162-168) which subtracts a signal (172-178) corresponding to the individual reconstructed signal (182-188).
4. A method according to Claim 3 wherein the signal corresponding to the individual reconstructed signal (182-188) is processed by a further Rake receiver (202) to provide:
 - i. a demodulated and despread signal to dedicated physical data channel (DPDCH) buffer (252); and
 - ii. a transport format indicator (TFI) signal (222);
wherein the TFI signal is buffered in TFI buffer (254), the bit rate is determined and passed to the bit rate adjuster circuit (264).
5. A method according to Claim 2 wherein the further Rake receiver (202) provides a transmit power control (TPC) signal whereby to enable a transmitter to transmit signals to the receiver at an appropriate power level.
6. A method according to Claim 2 wherein the further Rake receiver (202) provides a signal to noise plus a deference (SNI) signal (242).
7. A method according to Claim 1 wherein the first signal processor comprises a first joint detection device (400), the joint detection device processing signals with respect to their signal codes whereby to determine TFI signals.

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8. A method according to claim 7, wherein the first signal processor provides a plurality of further control signals for extracting said desired signal.

9. A method according to claim 8, wherein said plurality of further control signals comprise a transmit power control (TPC) signal and a signal to noise plus interference (SNI) signal.

10. In a communication system employing coded signals, apparatus operable to extract a desired coded signal from a composite signal comprising the desired signal and one or more interfering coded signals, the apparatus comprising:-

- a) receiver means arranged to receive a signal;
- b) a first signal processor (112 – 118; 400) for processing individual signals, for each received signal code;
- c) buffer and decoder circuits (254, 264; 420, 430) for determining transport format indicator (TFI) signals, to provide a bit rate of a frame for at least one interfering signal;
- d) a path divider for dividing the TFI signal path into first and second signal paths;

wherein, in the first signal path (442, 452), TFI signals are passed via a latch (290; 440, 450), to provide the first signal processor with a TFI signal, whereby to assign the bit rate determined for said last frame for the next frame; and

wherein, in the second path (422, 432), TFI signals are passed to a further signal processor (262; 500) to adjust the bit rate of an output signal (280; 510 – 540).

11. Apparatus according to Claim 10 wherein the first signal processor comprises a bank of Rake receiver (112-118), each Rake receiver (112-118)

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operable to demodulate and despread only signals having a code associated with the Rake receiver, each Rake receiver (112-118) being operable to output a decision variable signal which is applied to a decision device (122-128) which is operable to limit the output and, the decision device (122-128) being operable to output to a remodulation/respread unit (132-138) which is operable to provide a remodulated and respread signal to a channel reconstruction filter (142-148), the filter (142-148) being operable to receive a channel estimation signal (CE1) from said Rake receiver (112-118) to provide a reconstructed signal which is fed to a summer (150) to provide a signal (155) which is then subtracted in a bank of subtractors (162-168) which are operable to subtract a signal (172-178) corresponding to the individual reconstructed signal (182-188).

12. Apparatus according to Claim 11 comprising a further Rake receiver (202) and a TFI buffer (254), wherein the further Rake receiver is operable to process the signal from the subtractor (190) to provide;

- i. a demodulated and despread signal to dedicated physical data channel (DPDCH) buffer (252); and
- ii. a transport format indicator (TFI) signal (222);

wherein the TFI signal is buffered in the TFI buffer, and the bit rate is determined and passed to the bit rate adjuster circuit (264).

13. Apparatus method according to Claim 12 wherein the further Rake receiver (202) is operable to provide a transmit power control (TPC) signal whereby to enable a transmitter to transmit signals to the receiver at an appropriate power level.

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14. A method according to Claim 12 wherein the further Rake receiver (202) is operable to provide a signal to noise plus a difference (SNI) signal (242).

15. A method according to Claim 10 wherein the first signal processor comprises a first joint detection device (400), the joint detection device being operable to process signals with respect to their signal codes whereby to determine TFI signals.

16. A method according to claim 15, wherein the first signal processor is operable to provide a plurality of further control signals for extracting said desired signal.

16. A method according to claim 15, wherein said plurality of further control signals comprise a transmit power control (TPC) signal and a signal to noise plus interference (SNI) signal.

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1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

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